S0018-1225

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Subject: ADDITIONAL ANALYSIS RESULTS FOR THE 1301-N/1325-N FACILITY SAMPLES

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FLUOR GLOBAL SERVICES

April 12, 2000 FH-0002019

Ms. J. H. Kessner, Program Manager
Analytical Services
Bechtold Hanford, Inc. H9-03
Post Office Box 969
Richland, Washington 99352

Dear Ms. Kessner:

ADDITIONAL ANALYSIS RESULTS FOR THE 1301-N/1325-N FACILITY SAMPLES

This letter serves to provide the results for the additional analyses requested on sample BOTC01 that was received from the 1301-N/1325-N facility on December 22, 1998. A request for additional analysis was received on February 10, 2000. The results and a brief narrative are included in the attachments.

- Attachment 1: Narrative
- Attachment 2: Data Summary Report
- Attachment 3: Sample Breakdown Diagram
- Attachment 4: Request for Sample Analysis

If you have any questions regarding this report, please feel free to call me on 373-4314.

Sincerely,

Ruth A. Esch, Project Coordinator
222-S Laboratory - Analytical Production
Analytical Services Project

rae:fjh

Attachments 4

FH-0002019

Attachment 1

Additional Analysis Results for the 1301-N/1325-N Facility Samples

Consisting of 2 pages including cover page

ADDITIONAL ANALYSIS RESULTS FOR THE 1301-N/1325-N FACILITY SAMPLES

The Laboratory received an RSA requesting additional analysis of ICP metals, mercury (Hg) and isotopic uranium on the soil sample BOTC01 that was previously received and analyzed for TCLP metals and radionuclides. A brief discussion of the results follows.

Standard Recoveries

The recoveries for all analytes except silicon (Si) were within 80% - 120% recovery. The Si standard recovery of 156.2% was attributed to unavoidable leaching from the glassware during the acid digestion. Because this leaching is unavoidable, no reanalysis was requested.

Relative Percent Difference (RPD) between Sample and Duplicate Results

Silicon (26.4%) and Hg (26.0%) were the only analytes with RPDs greater than 20%. The poor precision for the Si analysis was attributed to the leaching problem described above and no reanalysis was requested. The high RPD for Hg was attributed to the nature of the sample and the very small sample size used. Since only 0.4 g was used of a soil matrix with varying particle sizes, a reanalysis will not necessarily improve the sample results.

Spike Recoveries

Although analysis of a matrix spike was not requested on the RSA, a matrix spike was prepared for the ICP and isotopic uranium analyses to help assess the accuracy of these analyses. The following analytes had spike recoveries outside of the limits of 75% - 125% recovery: calcium, iron, potassium, magnesium, manganese, phosphorus, silicon, and zinc. Most of these failures were attributed to the high concentration of analyte found in the sample compared to the amount of spike added. The poor recovery for potassium might be attributed to the dilution of the sample so that the concentration of the spike in the solution analyzed was near the detection limit, so that when corrected for the dilution it gave a high result. The post-digestion spike recoveries were all between 90% and 103% recovery.

FH-0002019

Attachment 2

Data Summary Report

Consisting of 2 pages including cover page

Data Summary Report
N FACILITY

RISER: n/a
SEGMENT #: BOTC01

SEGMENT PORTION: Soil

Sample# R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S00M000085	A	Uranium-233 by ICP/MS AcidD159	ug/g	n/a	<2.52e-4	<5.00e-02	<5.10e-2	n/a	n/a	n/a	5.00e-02	n/a
S00M000085	A	Uranium-234 by ICP/MS AcidD159	ug/g	n/a	<2.52e-4	<5.00e-02	<5.10e-2	n/a	n/a	n/a	5.00e-02	n/a
S00M000085	A	Uranium-235 by ICP/MS AcidD159	ug/g	n/a	<2.52e-4	8.43e-01	8.11e-01	8.27e-01	3.87	n/a	5.00e-02	n/a
S00M000085	A	Uranium-236 by ICP/MS AcidD159	ug/g	n/a	<3.36e-4	9.29e-02	9.30e-02	9.29e-02	0.11	n/a	6.66e-02	n/a
S00M000085	A	Uranium-238 by ICP/MS AcidD159	ug/g	108.0	<2.52e-4	1.16e+02	111.0	113.2	4.41	88.00	5.00e-02	n/a
S00M000085	A	Silver -ICP-Acid Digest	ug/g	91.20	<1.00e-2	< 5.950	<6.07e0	n/a	n/a	89.50	5.940	n/a
S00M000085	A	Aluminium -ICP-Acid Digest	ug/g	93.40	1.30e-01	4.42e+03	4.49e+03	4.46e+03	1.57	83.00	29.80	n/a
S00M000085	A	Arsenic -ICP-Acid Digest	ug/g	89.80	<1.00e-1	< 59.50	<6.07e1	n/a	n/a	90.90	59.40	n/a
S00M000085	A	Boron -ICP-Acid Digest	ug/g	103.6	6.18e-01	<2.98e+02	<3.03e2	n/a	n/a	102.0	298.0	n/a
S00M000085	A	Barium -ICP-Acid Digest	ug/g	92.80	<5.00e-2	1.60e+02	148.0	154.0	7.79	83.80	29.80	n/a
S00M000085	A	Beryllium -ICP-Acid Digest	ug/g	92.80	<5.00e-3	< 2.980	<3.03e0	n/a	n/a	90.10	2.980	n/a
S00M000085	A	Bismuth -ICP-Acid Digest	ug/g	88.40	<1.00e-1	< 59.50	<6.07e1	n/a	n/a	92.00	59.40	n/a
S00M000085	A	Calcium -ICP-Acid Digest	ug/g	93.00	2.31e-01	8.72e+03	8.90e+03	8.81e+03	2.04	-8.58e+01	594.0	n/a
S00M000085	A	Cadmium -ICP-Acid Digest	ug/g	89.40	<5.00e-3	3.480	<3.03e0	n/a	n/a	91.60	2.980	n/a
S00M000085	A	Cerium -ICP-Acid Digest	ug/g	94.60	<1.00e-1	< 59.50	<6.07e1	n/a	n/a	93.40	59.40	n/a
S00M000085	A	Cobalt -ICP-Acid Digest	ug/g	90.60	<2.00e-2	18.00	20.00	19.00	10.5	91.60	11.90	n/a
S00M000085	A	Chromium -ICP-Acid Digest	ug/g	92.20	<1.00e-2	1.24e+02	141.0	132.5	12.8	89.80	5.940	n/a
S00M000085	A	Copper -ICP-Acid Digest	ug/g	92.60	<1.00e-2	2.10e+02	208.0	209.0	0.96	84.80	5.940	n/a
S00M000085	A	Iron -ICP-Acid Digest	ug/g	93.60	5.41e-02	6.87e+04	6.98e+04	6.92e+04	1.59	-1.63e+03	298.0	n/a
S00M000085	A	Potassium -ICP-Acid Digest	ug/g	85.00	<5.00e-1	<2.98e+03	<3.03e3	n/a	n/a	205.0	2.98e+03	n/a
S00M000085	A	Lantharum -ICP-Acid Digest	ug/g	95.00	<5.00e-2	< 29.80	<3.03e1	n/a	n/a	92.60	29.80	n/a
S00M000085	A	Lithium -ICP-Acid Digest	ug/g	92.80	<1.00e-2	< 5.950	<6.07e0	n/a	n/a	91.50	5.940	n/a
S00M000085	A	Magnesium -ICP-Acid Digest	ug/g	90.60	<1.00e-1	2.15e+03	2.24e+03	2.20e+03	4.10	66.10	594.0	n/a
S00M000085	A	Manganese -ICP-Acid Digest	ug/g	87.00	<1.00e-2	7.01e+02	712.0	706.5	1.56	64.50	59.40	n/a
S00M000085	A	Molybdenum -ICP-Acid Digest	ug/g	93.00	<5.00e-2	< 29.80	<3.03e1	n/a	n/a	92.70	29.80	n/a
S00M000085	A	Sodium -ICP-Acid Digest	ug/g	116.4	1.03e+00	1.12e+03	1.15e+03	1.14e+03	2.64	81.40	59.40	n/a
S00M000085	A	Neodymium -ICP-Acid Digest	ug/g	96.40	<1.00e-1	< 59.50	<6.07e1	n/a	n/a	93.80	59.40	n/a
S00M000085	A	Nickel -ICP-Acid Digest	ug/g	90.20	<2.00e-2	2.15e+02	256.0	235.5	17.4	85.40	11.90	n/a
S00M000085	A	Phosphorus -ICP-Acid Digest	ug/g	91.80	<2.00e-1	4.65e+03	4.73e+03	4.69e+03	1.71	-4.58e+01	1.19e+03	n/a
S00M000085	A	Lead -ICP-Acid Digest	ug/g	87.20	<1.00e-1	2.78e+02	271.0	274.5	2.55	82.00	59.40	n/a
S00M000085	A	Sulfur -ICP-Acid Digest	ug/g	88.20	<1.00e-1	<5.95e+02	<6.07e2	n/a	n/a	105.0	594.0	n/a
S00M000085	A	Antimony -ICP-Acid Digest	ug/g	89.80	<6.00e-2	< 35.70	<3.64e1	n/a	n/a	90.20	35.70	n/a
S00M000085	A	Selenium -ICP-Acid Digest	ug/g	90.40	<1.00e-1	< 59.50	<6.07e1	n/a	n/a	86.10	59.40	n/a
S00M000085	A	Silicon -ICP-Acid Digest	ug/g	156.2	1.16e+00	2.40e+03	3.13e+03	2.76e+03	26.4	159.0	298.0	n/a
S00M000085	A	Samarium -ICP-Acid Digest	ug/g	95.00	<1.00e-1	< 59.50	<6.07e1	n/a	n/a	91.80	59.40	n/a
S00M000085	A	Strontium -ICP-Acid Digest	ug/g	92.80	<1.00e-2	75.80	82.00	78.90	7.86	88.00	5.940	n/a
S00M000085	A	Titanium-ICP-Acid Digest	ug/g	94.60	<1.00e-2	3.32e+02	371.0	351.5	11.1	94.50	5.940	n/a
S00M000085	A	Thallium -ICP-Acid Digest	ug/g	89.20	<2.00e-1	<1.19e+02	<1.21e2	n/a	n/a	87.70	119.0	n/a
S00M000085	A	Uranium -ICP-Acid Digest	ug/g	96.20	<5.00e-1	<2.98e+02	<3.03e2	n/a	n/a	100.0	298.0	n/a
S00M000085	A	Vanadium -ICP-Acid Digest	ug/g	93.20	<5.00e-2	< 29.80	<3.03e1	n/a	n/a	94.10	29.80	n/a
S00M000085	A	Zinc -ICP-Acid Digest	ug/g	88.00	<1.00e-2	9.45e+02	958.0	951.5	1.37	58.60	59.40	n/a
S00M000085	A	Zirconium -ICP-Acid Digest	ug/g	95.00	<1.00e-2	< 5.950	<6.07e0	n/a	n/a	96.40	5.940	n/a
S98M000415		Mercury by CVAA (PE) with FIAS	ug/g	100.8	<8.0e-5	2.815	3.657	3.236	26.0	n/a	1.420	n/a

FH-0002019

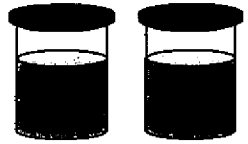
Attachment 3

Sample Breakdown Diagram

Consisting of 2 pages including cover page

1301-N/1325-N Facility Samples

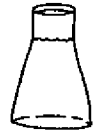
Soil Sample
BOTCO1



S98M000415

Hg

Acid Digest



S00M000085

ICP: metals
Isotopic Uranium

FH-0002019

Attachment 4

Request for Sample Analysis

Consisting of 2 pages including cover page

DB0139

REQUEST FOR SAMPLE ANALYSIS (RSA)

Group ID No. (For lab use only): 9800692

1. Sample Origin	2. Date Sampled	4. Requestor's Name	6. CACN/COA	7. Cost Center
1301-N/1325-N Facility	12/22/98	Steve Trent		

Customer/Project Code	3. Submitted By	5. Requestor's Phone/MSIN/FAX
[redacted]	Steve Trent	372-9651

8. Customer ID No.	9. Container ID No.	10. Volume of Sample	11. Matrix of Sample	12. Requested Analyses	13. Expected Range
BØTDJ2	[redacted]			Subsample Package to ship	
BØTDJ3	[redacted]			" " } See 18 below	
BØTBY8	[redacted]			" " } See 18 below	
BØTCØØ	[redacted]			" " } See 18 below	
BØTCØ1	[redacted]			ICP (all metals) & Hg see ☐ below	

14. Does sample have a MSDS?

- ○ Yes HEHF assigned MSDS No. _____
- ☒ No Description of process that produced waste/sample:

See Analytical Instruction

Will radiochemistry results be used for unconditional release? ○ Yes ○ No

15. Is this sample RCRA listed? ☒ Yes ○ No

Applicable Listed Waste Codes:

- ○ Yes ○ No P Codes: (list) _____
- ○ Yes ○ No U Codes: (list) _____
- ○ Yes ○ No K Codes: (list) _____
- ☒ Yes ○ No F Codes: (list) methanol

Applicable Characteristic Codes:

- ○ Yes ○ No D001: (how determined) _____ Ignitable
- ○ Yes ○ No D002: (how determined) _____ Corrosive
- ○ Yes ○ No D003: (how determined) _____ Reactive
- ○ Yes ○ No Toxic: (list codes) _____

PCB: Does this waste/sample contain PCBs?

- ☐ Yes Over 500 ppm
- ☐ Yes Over 50 ppm
- ☐ Yes PCBs are suspected
- ☒ No PCBs are suspected

If YES, what is the source of the PCBs?

- ☐ Transformer, capacitor, or ballast
- ☐ Other, specify _____
- ☐ Unknown

16. Sample Disposition

- ☐ Return to Customer
- ☐ Samples found to contain PCBs will be returned to the customer
- ☐ Dispose of per facility procedures with applied charges for analyses and disposal

Sample(s) Dose Rate at Contact

HPT Signature _____

17. QC Required ☐ Per 222-S Laboratory Quality Assurance Plan (HNF-SD-CP-QAPP-016)

☒ Other (list reference document or attach) 1 STD, 1 Blank, 1 Dup. per analytical batch

18. Special Instructions (Special Storage Requirements, Reporting format, holding times, etc.)

Each sample will be subsampled into two separate bottles, containing 10 grams each. Each bottle will be labelled with the sample number and amount of sample therein.

19. Requested Turnaround Time

- ☐ 2 Weeks ☐ 4 Weeks
- ☐ Other _____

20. Sample Received By:

_____ Date _____ Time _____

21. Chain of Custody

- ○ No ○ Yes

Number: _____

A-6002-365 (01/99)

ORIGINAL Dayes 3/21/00

SDR # B00-063
Revision #: 0
Date Initiated: 2/29/00

SAMPLE DISPOSITION RECORD

SAF: B00-032
OU: 100-NR-1
Project ID: N-Cribs
Task ID: 1
Sampling Event: 100-N Crib Sampling

Laboratory: 222-S Lab Operations

Task Manager: J. D. Fancher

Sampling Information:
Number of Samples: 1
ID Numbers: B0TC01-A
Matrix: Soil
Collection Date: 12/17/98

Issue Background:

Class: ☐ Project Data Use ☒ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction

Type: Addition of Analyses

Description: Addition of Isotopic Uranium by ICP-MS Method

Disposition:

Description: The 100-N Remedial Action/Waste Disposal Project requested that the laboratory analyze the listed sample for isotopic uranium. The laboratory was instructed to use for the ICP-MS method for isotopic uranium.

Justification: Isotopic uranium data are needed to complete the waste profile and other waste disposal technical documentation in support of 100-N crib remediation.

Approval Signatures:

S. J. Trent 3/15/00
Project Coordinator (Print/Sign Name) Date

J. D. Fancher 3/14/00
Task Manager (Print/Sign Name) Date